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09/897,377	07/02/2001	Stephen R. W. Cooper	TRW(TE)4231	8475

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EXAMINER	
SHERALI, ISHRAT I	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/897,377	COOPER, STEPHEN R. W.	
	Examiner	Art Unit	
	Sherali Ishrat	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/2/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5-6 and 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, claim in line 2, recites "means for directing comprises MEM device". This limitation is indefinite because it is not understood what is MEM.

Regarding claim 6, claim in lines 3-4, recites "MEM device comprises means for providing electrostatic force". This limitation is indefinite because it is not understood what is MEM.

Regarding claim 16, claim in line 2, recites "scan means comprises a MEM device". This limitation is indefinite because it is not understood what is MEM.

Regarding claim 17, claim in line 2, recites MEM device comprises a reflective surface". This limitation is indefinite because it is not understood what is MEM. Claim 18 is dependent on claim 17 therefore claim 18 is also rejected.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 7, 9-14, 20-23 are rejected under 35 U.S.C. 102(b) as being by Breed et al. (US 5,835,613).

Regarding claims 1 and 22, Breed discloses occupant sensor (Breed in col. 14, lines 66-67 , states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4.)

modulating a scanned occupant beam (Breed in FIGs 1A through 2 shows scanned occupant beam, Breed in col. 14, lines 66-67 thru col. 15, lines 4-10, states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4. A 48 MHz signal is generated using a crystal oscillator and fed into a frequency tripler which produces an output signal at 144 MHz. The 144 MHz signal is fed into infrared diode driver causing it to emit infrared light modulated at 144 MHz. The infrared diode is directed at the vehicle occupant" and Breed in col. 15, lines 19-20, states "The infrared signal which is reflected from the occupant is received by receiver". In the system of Breed all this corresponds to modulating a scanned occupant beam);

mapping occupant contours in response to the modulated beam (Breed in col. 16, lines 37-42, states "such as determination of the presence of a rear facing child seat or an occupant, neural network is used to determine the rules for pattern recognition" and col. 16, lines 54-64, Breed states "the network operates on the

returned signal [As noted above Breed states in col. 15, lines 4-10, the received signal from the occupant is infrared modulated signal] from the CCD array, for example for the case of front passenger seat, through a training session with human occupants, with boxes, bags of groceries and other objects" and in col. 17, lines 5-8, "a neural computer can be used to implement neural network. In either case the implementation can be carried out by those skilled in the art of pattern recognition". Implementation of neural network for pattern recognition [outline/contours of object] on the returned or received modulated infrared signal from the occupant corresponds to mapping occupant contours in response to the modulated beam); and

determining an occupant characteristic in response to the mapped contours (Breed in col. 16, lines 37-42, states "such as determination of the presence of a rear at facing child seat or an occupant, neural network is used determine the rules for pattern recognition". Determination of the presence of a rear facing child seat or an occupant, using neural network for pattern recognition corresponds to determining an occupant characteristic in response to the mapped contours in the system of Breed);

Regarding claim 2, Breed discloses receiving beam reflection and determining phase difference (Breed, col. 15, lines 19-20, states "The infrared signal which is reflected from the occupant is received by receiver" and in col. 15, lines 33-39, Breed states ""The resulting 150 KHz frequency signal however now has phase angle. Both signal are fed into a phase detector which determine magnitude of angle x. It can be shown that with the above values, distance from the transmitting diode to the occupant

is x/345.6" which corresponds to determining phase difference between the emitted beam and the reflection associated with each point on occupant).

Regarding claim 3, Breed disclose directing the beam across a scan area (Breed in FIGs 1A -2 shows directing the beam across occupant scan area).

Regarding claim 4, directing comprises a moveable reflecting member (Breed in col. 14, lines 66-67 thru col. 15, lines 4-10, states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4. A 48 MHz signal is generated a crystal oscillator and fed into a frequency tripler which produces an output signal at 144 MHz. The 144 MHz signal is fed into infrared diode driver causing it to emit infrared light modulated at 144 MHz. The infrared diode is directed at the vehicle occupant". The occupant is shown in FIGs 1A-2 as human driver which corresponds to a moveable reflecting member).

Regarding claims 7, Breed discloses modulating comprise electromagnetic source and drive component that drive the source at a modulation (Breed in col. 15, lines 4-10, states The 144 MHz signal is fed into infrared diode driver causing it to emit infrared light modulated at 144 MHz. The infrared diode is directed at the vehicle occupant". This corresponds to modulation comprises electromagnetic source and drive component).

Regarding claim 9, Breed disclose determining occupant presence (Breed in col. 15, lines 63-65, states " The occupant monitoring system with proper pattern recognition can ascertain whether or not passenger is present". This corresponds to determining occupant presence).

Regarding claims 10, Breed disclose determining occupant location (Breed in col. 16, lines 2-10, states "trainable pattern recognition can distinguish between an occupant and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air in this situation as well situation of a rear facing child seat". This corresponds to determining occupant location).

Regarding claim 11, Breed discloses determining occupant type (Breed in col. 16, lines 2-10, states "trainable pattern recognition can distinguish between an occupant and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air in this situation as well situation of a rear facing child seat". This corresponds to determining occupant type).

Regarding claim 12, Breed discloses providing indication of determined occupant characteristic to determining control of an air bag (Breed in col. 16, lines 2-10, states "trainable pattern recognition can distinguish between an occupant and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air bag in this situation as well situation of a rear facing child seat". This corresponds to determining indication of determined occupant characteristic to determining control of an air bag).

Regarding claim 13, occupant protection device is an air bag (Breed in col. 16, lines 2-10, states "trainable pattern recognition can distinguish between an occupant

and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air bag in this situation as well situation of a rear facing child seat")

Regarding claims 14 and 23 Breed discloses occupant sensor (Breed in col. 14, lines 66-67 , states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4.)

emitting a beam (Breed in FIGs 1A through 2 shows emitting a beam, Breed in col. 14, lines 66-67 thru col. 15, lines 4-10, states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4. A 48 MHz signal is generated a crystal oscillator and fed into a frequency tripler which produces an output signal at 144 MHz. The 144 MHz signal is fed into infrared diode driver causing it to emit infrared light modulated at 144 MHz. The infrared diode is directed at the vehicle occupant". This corresponds to emitting a beam);

modulating the beam (Breed in col. 14, lines 66-67 thru col. 15, lines 4-10, states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4. A 48 MHz signal is generated using a crystal oscillator and fed into a frequency tripler which produces an output signal at 144 MHz. The 144 MHz signal is fed into infrared diode driver causing it to emit infrared light modulated at 144 MHz". This corresponds modulating the beam);

directing the beam toward occupant in a pattern that moves across a plurality of points on the occupant (Breed in FIGs 1A-2 shows directing the beam toward occupant in a pattern that moves across a plurality of points on the occupant);

receiving reflection of the beam from the occupant (Breed in col. 15, lines 19-20, states "The infrared signal which is reflected from the occupant is received by receiver");

determining phase difference between the emitted beam and the reflection associated with each point on occupant (Breed, col. 15, lines 19-20, states "The infrared signal which is reflected from the occupant is received by receiver" and in col. 15, lines 33-39, Breed states ""The resulting 150 KHz frequency however now has phase angle. Both signal are fed into a phase detector which determine magnitude of angle x. It can be shown that with the above values, distance from the transmitting diode to the occupant is x/345.6" which corresponds to determining phase difference between the emitted beam and the reflection associated with each point on occupant);

mapping a location and contour representation of occupant using the determined phase differences (Breed, col. 14, lines 67-68 thru col. 15, lines 1-40, as discussed above Breed shows occupant position sensor in which received/reflected signal from the occupant is fed into phase detector and based on the phase difference, distance from the transmitting diode to the occupant [x/345.6] is determined, and in col. 16, lines 2-10, Breed states "trainable pattern recognition [object contour/outline] can distinguish between an occupant and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air in this situation as

well situation of a rear facing child seat" i.e Breed shows that pattern [contour/ouline of object] of occupant is determined based on the distance or location information such as out of position child who is standing or otherwise position adjacent to the air bag. All this corresponds to location/position of occupant is determined based on phase difference between transmitted and reflected signal and pattern [contour/outline of object] recognition of occupant is determined based on location/position of occupant such as out of position child who is standing or otherwise position adjacent to the air bag which corresponds to mapping a location and contour [pattern recognition] representation of occupant using the determined phase differences); and

determining characteristic of the occupant using contour and location representation of the occupant (Breed in col. 16, lines 2-10, states "trainable pattern recognition can distinguish between an occupant and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air bag in this situation as well situation of a rear facing child seat" This corresponds to determining characteristic of the occupant using contour and location representation of the occupant).

Regarding claim 20, Breed disclose determining distance using phase difference (Breed in col. 15, lines 19-20, states "The infrared signal which is reflected from the occupant is received by receiver" and in col. 15, lines 33-39, Breed states "The resulting 150 KHz frequency however now has phase angle. Both signal are fed into a phase detector which determine magnitude of angle x. It can be shown that with the above

values, distance from the transmitting diode to the occupant is x/345.6" which corresponds to determining phase difference between the emitted beam and the reflection associated with each point on occupant).

Regarding claim 21, Breed discloses providing indication of determined occupant characteristic to determining control of an air bag (Breed in col. 16, lines 2-10, states "trainable pattern recognition can distinguish between an occupant and a bag of groceries, for example out of position child who is standing or otherwise position adjacent to the air bag, the occupant position sensor describe herein can prevent the deployment of the air bag in this situation as well situation of a rear facing child seat". This corresponds to determining indication of determined occupant characteristic to determining control of an air bag).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 5-6 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breed et al. (US 5,835,613) in view of Kraft (US 6,099,030) and Roberson (US 6,137,623).

Regarding claims 5 and 16, Breed discloses directing comprises a moveable reflecting member (Breed in col. 15, lines 6-10, states "The 144 MHz signal is fed into

infrared diode driver causing it to emit infrared light modulated at 144 MHz. The infrared diode is directed at the vehicle occupant". The occupant is shown in FIGs 1A-2 as human driver which corresponds to a moveable reflecting member and col. 15, lines 18-20, "The infrared signal which is reflected from the occupant is received by receiver", occupant in the system of Breed this corresponds to directing comprises a moveable reflecting member because driver is moveable).

Breed however has not explicitly disclosed reflecting device and reflecting device and scan comprises MEM device.

In the same filed of endeavor of occupant protection Kraft discloses reflecting device (Kraft in col. 2, lines 61-65, states "belt material includes a beam reflecting portions or radiation reflecting die", which corresponds to reflecting device) and Roberson discloses MEM device (Roberson in col. 6 lines 31-35, microelectronic substrate are interconnected to form microelectronic reflectors". This interconnected substrate form microelectronic reflectors corresponds to MEM device.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the teaching of Kraft of placing reflecting device on the seat belt of occupant and use MEM device as reflecting device as show by Roberson in the system of Breed because such a system require less power for transmitting device and improved quality of reflected beams thereby improving the overall quality of occupant protection system.

Regarding claims 6, and 17, Breed disclose reflective surface is movable about two axes (Breed col. 15, lines 18-20, "The infrared signal which is reflected from the

occupant is received by receiver", since occupant and seat belt is movable in two axes therefore reflective surface is movable).

Breed, Kraft and Roberson have not explicitly shown electrostatic force to move reflective device. Since occupant and seat belt is movable therefore reflective surface is movable in the system Breed. However such a limitation of electrostatic force to move reflective device is design choice and does not carry patentable weight.

7. Claims 7, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breed et al. (US 5,835,613).

Regarding claims 7 and 15, Breed disclose beam and electromagnetic energy (Breed in FIGs 1A through 2 shows scanned occupant beam, Breed in col. 14, lines 66-67 thru col. 15, lines 4-8, states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4 using infrared. Which corresponds to beam and electromagnetic energy).

Breed has not explicitly shown infrared LED. However infrared LED is well known in prior art and such a limitation is design choice and does not carry patentable weight.

Regarding claim 19, Breed discloses modulating frequency (Breed in FIGs 1A through 2 shows scanned occupant beam, Breed in col. 14, lines 66-67 thru col. 15, lines 4-10, states "A particular implementation of an occupant position sensor having a range of from 0 to 2 meters is illustrated in the block diagram of FIG 4. A 48 MHz signal is generated using a crystal oscillator and fed into a frequency tripler which produces an output signal at 144 MHz. The 144 MHz signal is fed into infrared diode

driver causing it to emit infrared light modulated at 144 MHz. Which corresponds to modulating signal frequency).

Breed however has not disclosed 3 MHz frequency of modulation. However such a limitation of 3 MHz frequency of modulation is design choice and does not carry patentable weight.

Allowable Subject Matter

8. Claim 18 is objected as being dependent on rejected base claim but would be allowable if rewritten in independent form including limitations of the base claim and any intervening claims and also provided that claim 17 on which claim 18 is dependent overcome the rejection under 35 USC 112 second paragraph.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sherali Ishrat whose telephone number is 703-308-9589. The examiner can normally be reached on 8:00 AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Au Amelia can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ishrat Sherali

Patent Examiner

Group Art Unit 2621

February 10, 2005

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